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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,167	03/19/2001	Gerald George Kiernan	ARC920010026US1	9252

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EXAMINER

NGUYEN, TAM V

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 07/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

09/810,167

Applicant(s)

KIERNAN ET AL.

Examiner

Tam V Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-46 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### DETAILED ACTION

1. Claims 1-46 are pending in this action. Claims 1-46 are presented for examination. This office action is in response to the filing dated 03/19/01.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jayavel Shanmugasundaram (Relational Databases for Querying XML Documents: Limitations and Opportunities).

With respect to claims 1 and 44, Shanmugasundaram discloses generating a tagger tree graph from said XML query, (XML is a hierarchy data format information exchange in the WWW, pages 3, 1<sup>st</sup> col., lines 1-10) each node of said tagger tree graph comprising a tagger operator, (book, article and monograph is a tag operator, see fig. 8&9), each tagger operator having a parse tree associated, (edit, author, and name are a parse tree associated) therewith; calling each tagger operator in accordance with a structure of said tagger tree graph, (pages 2, 1<sup>st</sup> col., lines 1-10 and see fig. 8 &9). Shanmugasundaram does not explicitly teach ***evaluating said parse trees associated with each called tagger operator to tag of said XML language over said relational database.*** However, as taught by Shanmugasundaram, our approach to query XML

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documents is the following. First, we process a DTD to generate a relational schema. Second, we parse SML document conforming to DTDs and load them into topples of relational tables in a standard commercial DBMS (in case case, IBM DBS). Third, we convert the results back to XML, (pages 2, 1<sup>st</sup> col., lines 21-30) as step of ***evaluating said parse trees associated with each called tagger operator to tag of said XML language over said relational database***. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shanmugasundaram by including evaluating said parse trees associated with each called tagger operator to tag of said XML language over said relational database in order to make more appropriate for processing queries over XML documents, (page 1, 2<sup>nd</sup> col., lines 1-2).

As to claims 2 and 23, Shanmugasundaram further discloses starting with said top most tagger operator, each tagger operator implementing a method to request results form input to said tagger operator, said method causing lower-level tagger operators connected to said inputs to be called; starting with said lower-most tagger operators, each called tagger operator returning intermediate tagged result to a higher level connected tagger operator upon evaluating said associated parse tree; performing steps a and b until an end of said results of said XML query is reached, and said top-most tagger operator producing tagged output XML said results of said XML query.

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As to claim 3 and 24, Shanmugasundaram further discloses wherein said tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator.

As to claims 4 and 25, Shanmugasundaram further discloses wherein said tagger graph includes a tagger input operator for each level in a result XML tree of said XML query.

As to claims 5 and 26, Shanmugasundaram further discloses wherein said tagger input operators execute in a sorted outer union mode.

As to claims 6 and 27, Shanmugasundaram further discloses wherein said tagger input operators comprise a share tagger row stream.

As to claims 7 and 28, Shanmugasundaram further discloses wherein said tagger input operators execute in a node strip mode.

As to claims 8 and 29, Shanmugasundaram further discloses wherein each of said tagger operators comprises a tagger row stream.

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As to claims 9 and 30, Shanmugasundaram further discloses wherein each tagger operator performs any of a cr8\_element, a cr8\_attr, a cr8\_attr\_list, a cr8\_fragments or a cr8\_fragmen\_list function.

As to claims 10 and 31, Shanmugasundaram further discloses wherein each tagger operator implements a next method to produce a result row.

As to claims 11 and 32, Shanmugasundaram further discloses parsing said XML query; transforming said XML queries into a language-neutral intermediate representation; rewriting said language-neutral intermediate representation into an equivalent form easily translated into an SQL query; translating said equivalent form into one or more SQL queries over said relational database, and executing said one or more SQL queries to produce said results of said XML query over relational database.

As to claims 12 and 33, Shanmugasundaram further discloses wherein said tagger graph is generated from said equivalent form.

As to claims 13 and 34, Shanmugasundaram further discloses wherein said tagger graph includes a tagger input operator for each node in a result XML tree of said XML query.

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As to claims 14 and 35, Shanmugasundaram further discloses wherein said tagger input operators executed in a sorted outer union mode and said translating step produces a single SQL query to produce a single sorted outer union relational database result.

As to claims 15 and 36, Shanmugasundaram further discloses wherein said tagger input operators comprises a shared tagger row stream.

As to claims 16 and 37, Shanmugasundaram further discloses wherein said tagger input operator execute in a node strip mode and said translating step produces a set of SQL queries to produce a set of node strip relational database results.

As to claims 17 and 38, Shanmugasundaram further discloses wherein each of said tagger operators comprises a tagger row stream.

As to claims 18 and 39, Shanmugasundaram further discloses wherein said tagger operators comprise any of a tagger input operator, a tagger scalar operator or a tagger aggregate operator.

As to claim 19 and 40, Shanmugasundaram further discloses wherein a number of relational database tables of said relational database are mapped to a number of virtual XML documents said XML queries are issued over said virtual XML documents.

As to claim 20 and 41, Shanmugasundaram further discloses wherein said method operates over a distributed computing network.

As to claims 21 and 42, Shanmugasundaram further discloses wherein said method operates over the Internet.

With respect to claim 22, Shanmugasundaram discloses a tagger runtime, (pages 3, 1<sup>st</sup> col., lines 1-10); a tagger tree graph generated from said XML query, each node of said tagger tree graphic comprising a tagger operator, (book, article, monograph is a tag operator, see fig. 8 &9); a parse tree associated with each tagger operator, (edit, author, and name are a parse tree associated, see fig. 8&9); wherein said tagger runtime calls each tagger operator in accordance with a structure of said tagger tree, (pages 3, 1<sup>st</sup> col., lines 1-10). Shanmugasundaram does not explicitly teach ***evaluating said parse trees associated with each called tagger operator to tag of said XML language over said relational database.*** However, as taught by Shanmugasundaram, our approach to query XML documents is the following. First, we process a DTD to generate a relational schema. Second, we parse SML document conforming to DTDs and load them into tuples of relational tables in a standard commercial DBMS (in case case, IBM DBS). Third, we convert the results back to XML, (pages 2, 1<sup>st</sup> col., lines 21-30) as step of ***evaluating said parse trees associated with each called tagger operator to tag of said XML language over said relational***



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**database.** Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shanmugasundaram by including evaluating said parse trees associated with each called tagger operator to tag of said XML language over said relational database in order to make more appropriate for processing queries over XML documents, (page 1, 2<sup>nd</sup> col., lines 1-2).

With respect to claim 45, the subject matter of claim 45 are rejected in the analysis above claim 1; therefore, claim 45 is also rejected for the same reasons as given in the claim 1.

### ***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jahnke (EP 1225516A1) shows storing data of an XML-document in a relational database.

Nasr et al. (US 6263332B1) shows system and method for query processing of structured documents.

Cheng et al. (US 6519597B1) shows method and apparatus for indexing structured documents with rich data types.

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**Contact Information**

**5. Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam V Nguyen whose telephone number is (703) 305-3735. The examiner can normally be reached on 7:30AM-5:00PM.**

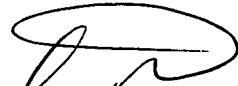
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Yen Vu can be reached on (703) 305-4393. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for formal communications and (703) 746-7240 for informal communications.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, Virginia 22202. Fourth Floor (Receptionist).

**7. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.**

TV:tv

06/20/03

  
JEAN M. CORRIELUS  
PRIMARY EXAMINER